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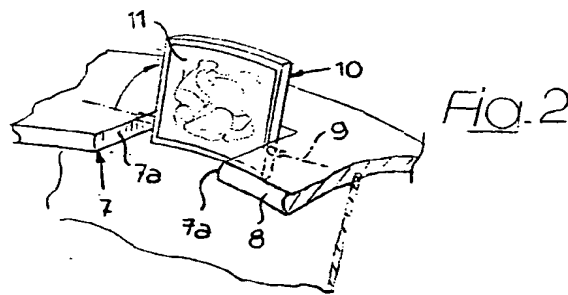
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(54) **Motor-vehicle dashboard with a foldable video display.**

(57) A motor-vehicle dashboard (1) has a wall (5) projecting from the instrument panel (3) having an aperture (7) within which there is pivotally mounted the flattened body (10) of a liquid crystal video display, which can be moved between a folded rest position, lying in the plane of the wall (5) and an unfolded position of use, substantially orthogonal to this plane.



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The present invention refers to motor-vehicle dashboards.

In recent years, an interest has been more and more developed towards navigation systems for motor-vehicles comprising a navigation computer and a video display, e.g. a liquid crystal video display, for optical display of information to the driver.

The integration of the video display in the dashboard however has relevant difficulties. Furthermore, the video display is somewhat bulky and therefore can not be arranged immediately adjacent to the instrument panel on the dashboard, so that the driver is compelled to turn his head towards the position in which the video display is located, in order to collect information therefrom. This causes a decrease in the safety degree in driving and further implies some inconvenience, since the driver is compelled to change his driving habit of looking at the instrument panel, along the longitudinal plane containing the axis of the steering wheel, only during short time intervals in which he may look away from the road in front.

The object of the present invention is that of providing a motor-vehicle dashboard which enables a video display to be easily integrated without compelling the driver, when looking at the display, to change his usual driving attitude and/or to decrease his degree of attention in driving.

In order to achieve this object, the invention provides a motor-vehicle dashboard, including an instrument-panel and at least one wall projecting therefrom, characterized in that said dashboard further includes a liquid crystal video display which has a substantially flattened body which is pivotally mounted within an aperture of said wall so as to be movable between a folded rest position, wherein said body lies in the plane of said wall, and an unfolded position for use, wherein said body is substantially orthogonal to said wall.

In one embodiment of the invention, said wall substantially extends horizontally along the upper edge or the lower edge of the instrument panel and said aperture is constituted by a slot formed in said wall from its front edge, the body of the display being pivotally supported by the two side surfaces of said slot around a transverse axis.

In another embodiment, the body is comprised of two portions which can be opened in a book-like fashion to said unfolded position for use.

A further embodiment provides for the possibility of adjusting the position of the body in the vertical direction once it has been rotated into its position for use.

Yet in another embodiment the video display may be folded in the upper wall of the casing of the steering shaft. In this regard, it must be noted that in the present description and in the appended claims, the expressions "dashboard" and "wall projecting from the instrument panel" must be understood in a broad

sense, to comprise also adjacent parts such as said wall of the casing of the steering shaft.

As it is clearly apparent from the foregoing description, the invention enables a liquid crystal video display to be easily integrated in the dashboard while arranging it immediately adjacent to the instrument panel, i.e. in the usual area of observation of the driver. This results in a greater comfort for the driver and also provides a driving safety generally greater with respect to cases in which the display of the navigation system is arranged on the dashboard in a position remote from the instrument-panel. At the same time, when the display is in its folded rest position, the design of the dashboard is not modified at all with respect to a conventional dashboard with no display.

Further features and advantages of the invention will be come apparent from the following description with reference to the annexed drawings, given purely by way of non limiting example, in which:

figure 1 is a perspective view of a first embodiment of the invention in a first condition of use, figure 2 shows a detail of figure 1 in a second condition of use,

figure 3 shows a variant of figure 1,

figure 4 shows a detail of figure 3 in a different condition of use,

figure 5 shows a variant of figure 4,

figure 6 shows a further variant of figure 2,

figure 7 is a front view of the detail of figure 6 in a different condition of operation,

figure 8 is a cross-section of view taken along line VIII-VIII of figure 6, and

figure 9 shows a further variant.

In the drawings, reference numeral 1 generally designates the dashboard of a motor car, comprising a body of plastic material 2 supporting an instrument panel 3, where instruments 4 are arranged, only some of which are shown, for clarity, in the drawings. Adjacent to the instrument panel 3, the dashboard 1 comprises an upper wall 5 and a lower wall 6 which are substantially flattened and project towards the driver.

In the example of figures 1, 2, the central portion of the upper wall 5, which extends substantially horizontally, has a slot 7 extending from its front edge 8, having two sides surfaces 7a which pivotally support the flattened body 10 of a liquid crystal video display around a transverse axis 9, said display having a screen 11 and a rear wall 12. The display 10 therefore may be moved between a rest folded position (figure 1) in which it is contained in the plane of the central portion of upper wall 5, and an unfolded position of use (figure 2) which is substantially orthogonal to said plane.

Figure 3 shows a variant in which the display 10 is arranged at the lower wall 6 of the dashboard. Figure 3 shows the display 10 in the folded rest position, whereas figure 4 shows the display 10 in the unfolded

position.

Figure 5 shows a variant of figure 4, which differs only for that the body 10 of the display is pivotally mounted to the side surfaces 7a of slot 7 at the bottom ends of the latter.

Figure 6 shows a further variant of the solution of figure 1, wherein the body 10 may be separated into two parts 10a which can be opened in a book-like fashion around articulation axis 9, as clearly visible also with reference to figure 7, 8. In this case, one of the two parts 10a may be used as control panel of the display and the other part 10a may carry the liquid crystal video screen.

Figure 9 shows a variant in which the display 10 is formed in the upper wall of the casing of the steering shaft (not shown in the figure). In this regard it is to be noted that in the present description and in the appended claims, the expressions "dashboard" and "wall projecting for the instrument panel" must be understood in a broad sense, to mean also adjacent parts such as said wall of the casing of the steering shaft.

Naturally, while the principle of the invention remains the same, the details of construction may widely vary with respect to what has been described and illustrated purely by way of example.

For example, it is possible to provide for the body 10 of the video display to be manually displaceable between its folded rest position and its unfolded position of use, or also spring means may be provided for biasing the body of the display towards its unfolded position as a result of the disengagement of a mechanism for locking the display in its folded rest position. Yet motor means may also be provided for driving the rotation of the body of the display.

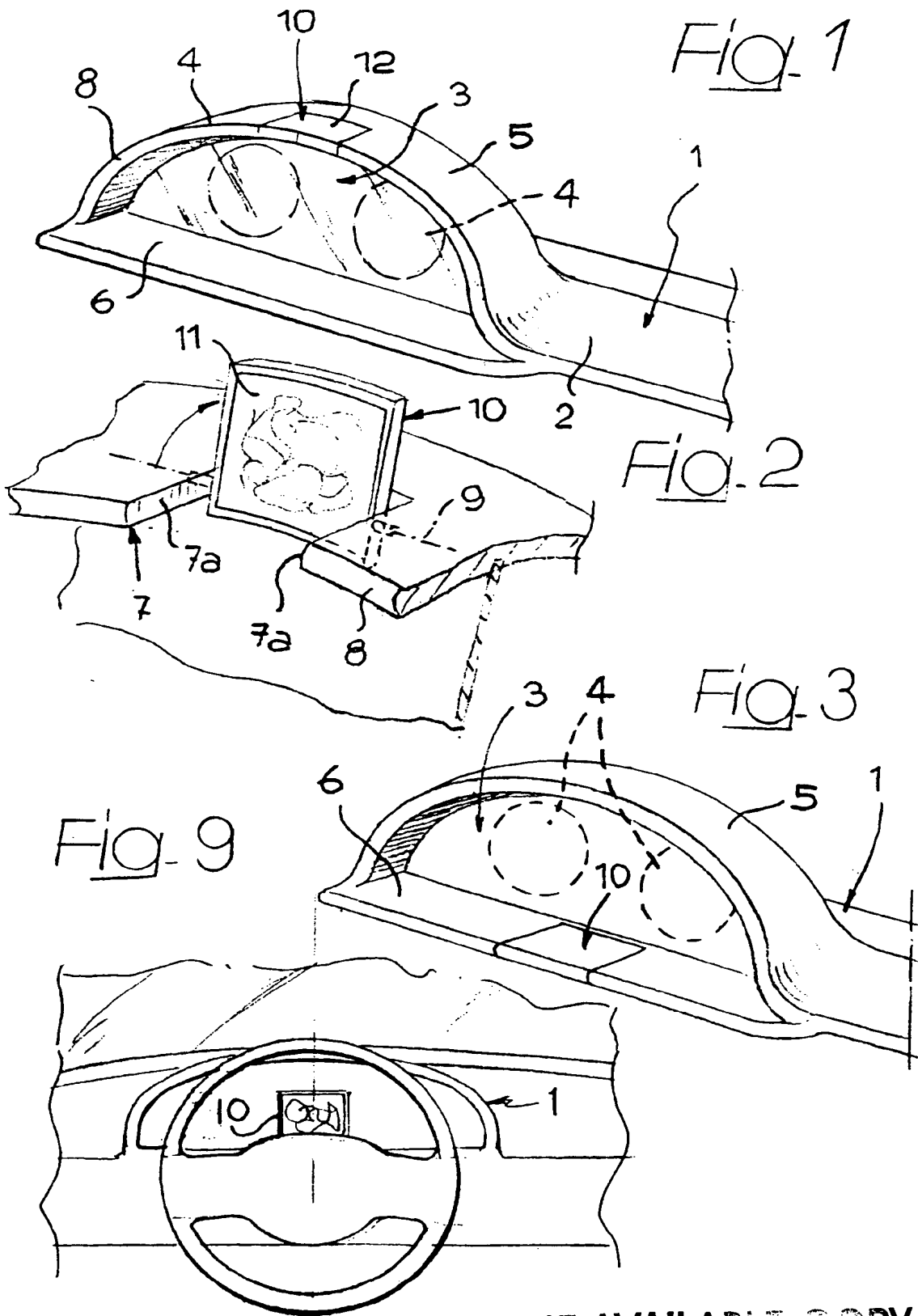
two side surfaces (7a) of said slot (7) around a transverse axis (9).

3. Dashboard according to claim 2, characterized in that the body can be separated into two portions (10a) which can be opened in a book-like fashion into said unfolded position of use.
4. Dashboard according to claim 3, characterized in that one of said portions (10a) is used as a control-panel and the other portion (10a) is used as video screen.
5. Dashboard according to claim 1, characterized in that said wall is a portion of the casing of the steering shaft.

## Claims

1. Motor-vehicle dashboard including an instrument panel (3) and at least one wall (5, 6) projecting therefrom, characterized in that said dashboard (1) includes a liquid crystal video display (10) which has a substantially flattened body which is pivotally mounted within an aperture (7) of said wall (5, 6), so as to be movable between a folded rest position, in which said body (10) lies in the plane of said wall, and an unfolded position of use, in which said body (10) is substantially orthogonal to said wall (5, 6).
2. Dashboard according to claim 1, characterized in that said wall extends substantially horizontal along the edge of said instrument panel (3) and said aperture (7) is constituted by a slot formed in said wall (5, 6) from its front edge (8), said body (10) of the display being pivotally supported by

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Fig. 4

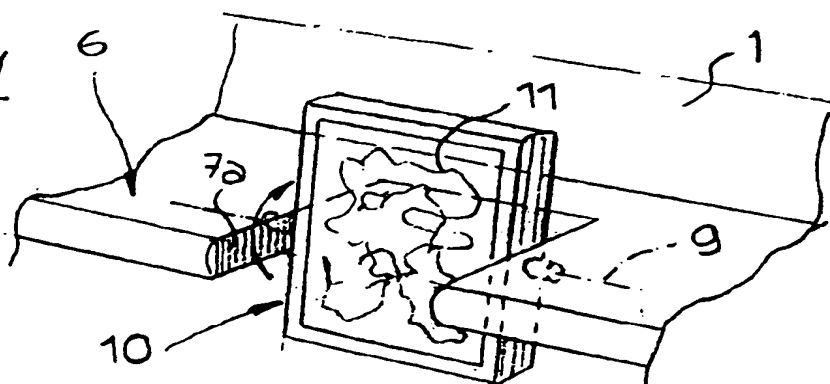


Fig. 5

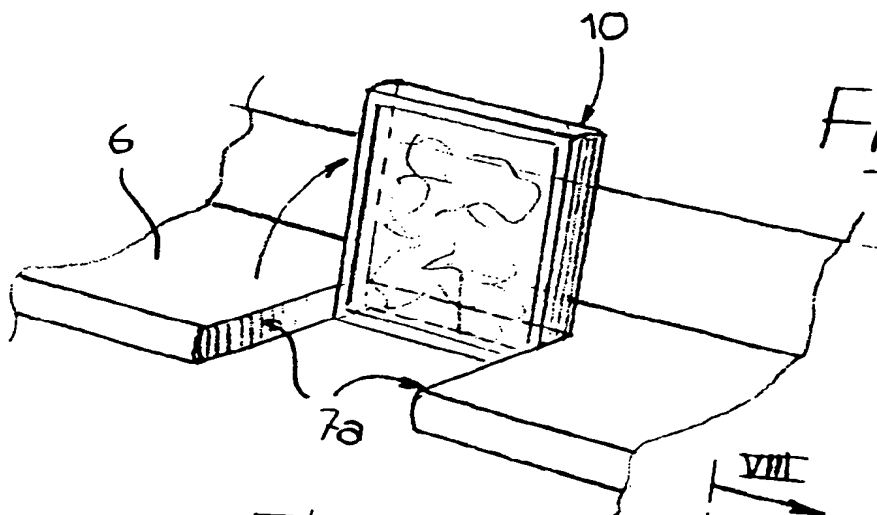


Fig. 6

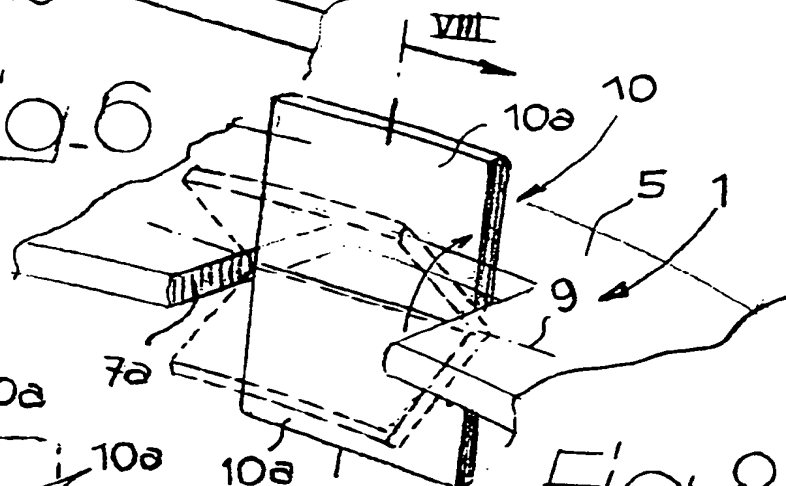


Fig. 7

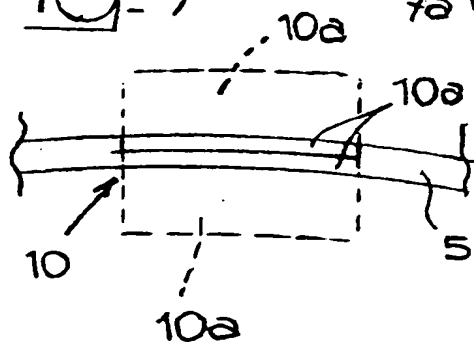
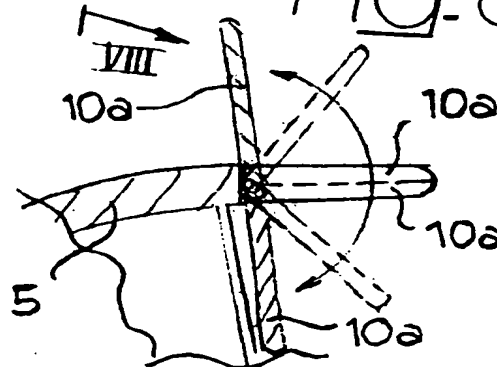


Fig. 8



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# EUROPEAN SEARCH REPORT

Application Number  
EP 95 83 0073

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	PATENT ABSTRACTS OF JAPAN vol. 15 no. 495 (P-1288) ,13 December 1991 & JP-A-03 215709 (ALPINE) 20 September 1991, * abstract *	1,2	B60K37/02
A	WO-A-92 04202 (VOLVO) * figures 2,3 *	1,2	
A	EP-A-0 338 405 (HITACHI) * abstract; figures *	1	
A	DE-A-41 28 663 (VDO) * abstract; figures 5,6 *	1	
A	DE-C-975 769 (DAIMLER-BENZ) * figure 1 *	5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B60K B60R
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The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 6 July 1995	Examiner Krieger, P.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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